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I.—The Office of Public Roads.

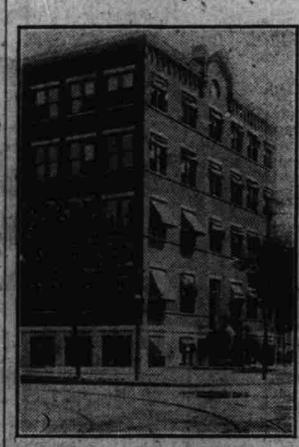
Home Course In Road Making

By LOGAN WALLER PAGE, Director Office of Public Roads United States Department of Agriculture

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N March, 1893, a petition was presented to congress asking that a road department similar to the agricultural department be founded at Washington for the purpose of promoting construction and maintenance of roads and for teaching students so that they might become skilled road engineers and to establish a permanent exhibit of sections of road illustrating various methods of construction and the best road materials and Wah Ying Chong machinery. This petition was signed by the governors of many of the states, including Governor McKinley of Ohio. by chambers of commerce and univerof legislatures.

The office of road inquiry was estab-



NITED STATES OFFICE OF PUBLIC BOADS

congress approved March 3, 1893, making appropriation of \$10,000 for the de-partment of agriculture. The clause relating to this work provided that the secretary of agriculture should make inquiries in regard to systems of road management throughout the United States, make investigations in regard to the best methods of road making, prepare publications on this subject and assist agricultural colleges and exeriment stations in disseminating in-

Since 1893 the total amount appro priated for the office of public roads is \$804,860, and since its establishmen the office has issued 40 bulletins, 95 circulars, 9 farmers' bulletins, 21 year book reprints and 18 annual reports, a total of 183 publications.

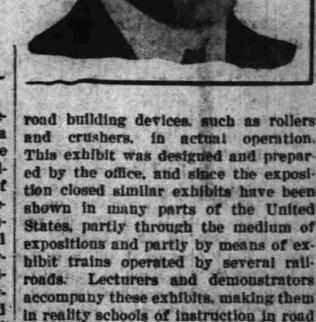
The office has directed the construc tion of about 346 object lessons and experimental roads, illustrating macadam, bituminous macadam, brick, gravel, sand-clay, shell and earth construc tion. The approximate expenditure on these object lessons and experimental roads by local authorities has been \$600,762, and the subsequent road work due directly to the object lesson roads represents expenditures running well up into millions. Lectures and personal advice by engineers and experts have constituted a prominent feature of the work of the office since its establishment. The road material laboratory was installed in December, 1900, and from that time to July 1, 1911, about 5,300 samples of road material have been received from practically every state in the Union and tested to determile their character and value for road

A photographic laboratory was installed in January, 1909, and has now a complete outfit. This was the direct result of a great need for illustrated lectures. The office has now a collection of about 6,000 negatives and about 3,000 slides, many of which have been The BICYCLE DEALER and RE. colored. These illustrate all phases of

Experiments have been conduct with oils, tars, rock asphalt and various preparations for the purpose of preventing dust and preserving macadam roads from destruction under modern traffic conditions. The office has conducted investigations to determine the feasibility of the sand-clay method of road building in the southern states as well as in the prairie states, and this method of construction has been found to be quite practicable, especially in the south

A study of the construction of roads, of natural soils by treatment with asphaltic oils, has been made and was published in circular No. 90. The office is conducting investigations on the use of slag as a road material and the

tenance of earth roads. fature models illustrating every known prises the first complete data ever astype of improved road and the various sembled on this subject.



Graduates in engineering are appointed from colleges each year after a competitive examination, and are given thorough training while rendering practical services to the government. In this way an efficient corps of ished under authority of an act of engineers is being built up, which will aid the development of road building along proper lines, both during and after their connection with the government. This work was begun in the fiscal year 1905.

Investigations into the decomposition of rock powders under the action of water have led to important discoveries with reference to increasing the cementing value of road materials. The investigation into the corrosion of iron and steel culverts has brought out important results. The generally accepted theories regarding the rusting of from have been demonstrated to be incorrect, and it has been shown that by treating the surface of the iron with a strong oxidizing agent the rusting can be inhibited.

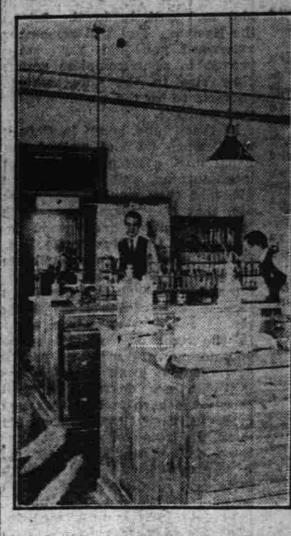
In May, 1907, the office inaugurated a project designed to introduce the best possible systems of construction: maintenance and administration of roads in the various counties. Under this plan engineers are assigned to make thorough investigation on all phases of the road work of the county to which they are assigned, and prepare exhaustive reports giving plans,

estimates and recommendations.

The number of the employees of the office has increased from one on July t. 1893, to 157 on July 1, 1911. The present appropriation of the office is \$100,720, out of which \$3,500 is paid for rent, leaving \$157.20 to pay the salaries of these 157 employees, as well as traveling expenses, the purchase of equipment and supplies, and the usual running expenses.

The most thorough and systematic methods of organization have been introduced into the administration of the office, and the great library on all phases of road work is the best in the western hemisphere, and the library is

being added to constantly. The policy of the office in recent years has been to co-operate with the officials in charge of road work in the various states as closely as possible, and the endeavor is being made so to correlate road work in each state by voluntary co-operation as to constitute one great movement along uniform lines and make the progress and methods of each state known to every other state through the medium of the office. In furtherance of this object a comprehensive investigation was begun in



SECTION OF THE BITUMINOUS LABORATORY OFFICE OF PUBLIC ROADS.

1904 to ascertain the mileage of improved and unimproved roads, the character of improvement, the amounts expended, rates of levy and sources of revenue in every county in the United improvement of sand roads in parts of States. This work was finished in the country where clay is not accessi- June, 1907, and the results were pubble. Practical efforts have been made lished in the form of a bulletin, which toward bringing about the more gener- shows that there are over 2.150,000 al use of the split log drag in the main- miles of road in the United States, of which only 7.14 per cent were improv-One of the unique and striking ed in 1904, and that the expenditure in exhibits at the Alaska-Yukon-Pacific money and labor for that year was exposition consisted of a series of min- nearly \$80,000,000. This bulletin com-- 4016



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